Losing it, Briefly

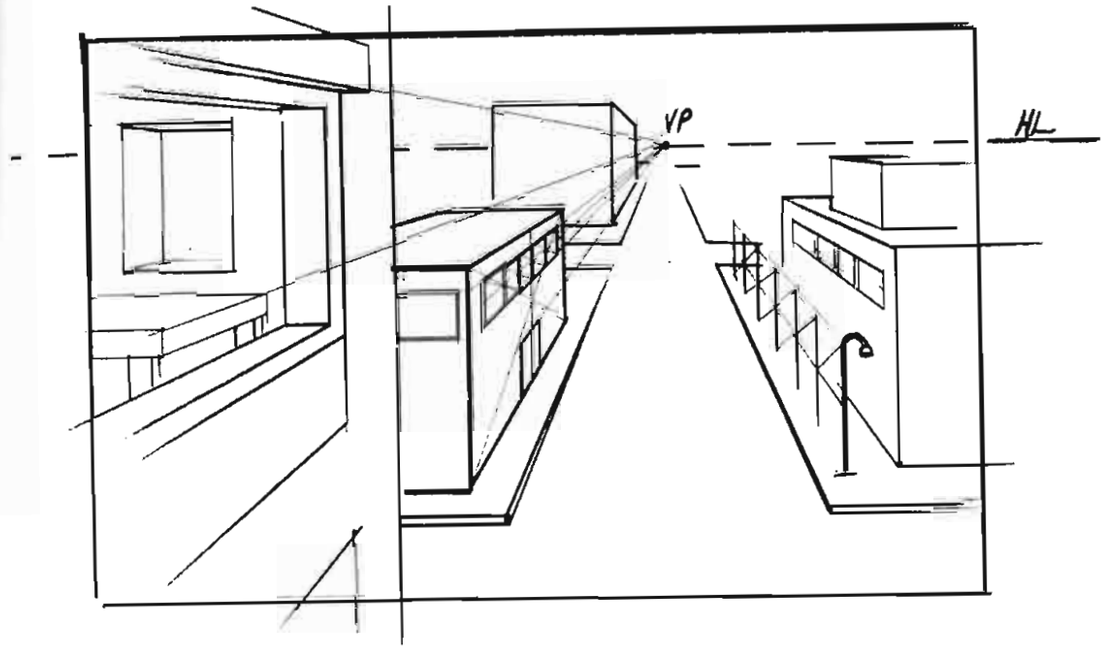
There are times when the extremely demanding hours of production bring out less than admirable behavior. The trick is to recover with grace and keep moving ahead. I was working on a shoot that was long on both hours and creativity. This being a combination that I eagerly pursue, I was pleased to be on the set late one night when a strange situation developed. It was 2 AM and we'd been shooting for hours, trying to finish a large crowd scene set in a hotel lobby. We were preparing for a stunt where someone would crash through one of the hotel's plate glass windows. Extras were milling about the lobby, drinking coffee and chatting quietly while the crew set up the next shot. It was my turn to collect all the craft service Styrofoam cups from the cast and extras on the set.

I approached a group of people sitting on a bench that was in the middle of the shot and asked them to please hand over their cups. One person in the group was using his cup as an ashtray and he refused to hand it to me. O.K, it was late and everyone tired, bored, and hungry, but the cameras were now about to roll. I asked again and the guy took the cup and hid it behind his back. Foolishly, I took the bait and reached behind him to nab it. He then decided to give it to me, and proceeded to crush the cup, butts and all, against my head.

This kind of rough play tends to escalate quickly. I hauled back and slapped him on the face and was rewarded with a kick to my shin. The crowd drew back, anticipating a real battle. I stand barely 5'3" and have no martial arts training, so I started screaming for reinforcements. The producer heard my cry and as he walked over I demanded that the hooligan be removed from the set.

It was then that I was informed that I had just struck an actor. Not a major one, but a necessary one, nonetheless. Embarrassed but not ashamed, I retreated to the relative calm of an adjacent room that the art department was using as a storage area. I was telling my side of the story to the crew when the producer came in and informed us that the actor was now refusing to work until he received an apology. Still hot with the passion of the fight, I refused. I was reminded that in this circumstance we needed to 'defer to talent.' I suggested that if that were the case, the actor should get down on his knees to me.

I was pissed. I had been roughed up in the course of performing my on-set duties and an apology was not forthcoming. But nothing was getting accomplished. We had a hundred extras waiting around and it was near 3 in the morning. Time to get off it. OK, I told him, I'll handle it. I went back to the set and approached my grumbling opponent. He sneered at me as I knelt by his side. I don't remember exactly what I said, but a few minutes later we shook hands and he went back to work. People working under high pressure and on little sleep can exhibit strange behavior. Sometimes it becomes necessary to remind yourself that it's only a movie.



7 Perspective

"...any person of sound mind can learn to draw; the probability is the same for learning to read."

Betty Edwards
Drawing on the Artist Within

An Introduction to Perspective

7

Perspective: from the Latin "prospectus,"
to look forward

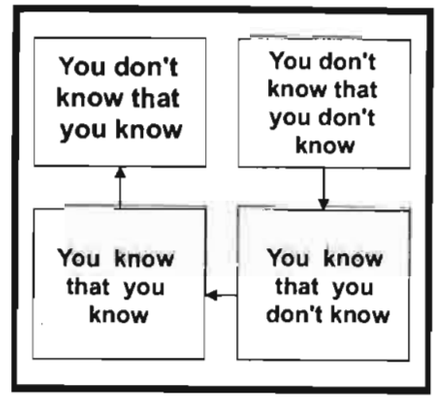
Why perspective?

Perspective is a topic that rarely surfaces when talking about film, but it is crucial to any discussion about translating the three-dimensional world into the two-dimensional plane of the film frame.

The world that surrounds us is one of three dimensions. The room you are sitting in is defined by width, length, and height. A piece of paper or strip of film has only two dimensions that are used for the image that rests upon it. In order to refer to the three dimensions of space on a two-dimensional surface, we need a drawing convention, an illusion that will trick the eye into thinking that the flat image has depth. Western art has developed a system of technical perspective that is invaluable to creating accurate storyboards; this chapter will spend some time helping you to become familiar with this drawing system.

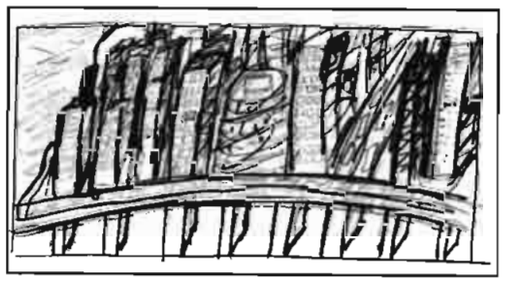
In perspective, the parallel lines that define an image's depth converge to a spot called the vanishing point. In this chapter you will **learn how to place your camera position to correspond with your vanishing points, so your sketch will accurately reflect your intended shot.** There is perhaps no better way to immediately improve your ability to communicate about the visual world than to learn this method of representation.

The prospect of learning this new material may seem daunting to some of you. I can only tell you that I have seen remarkable progress in just a few hours from students who walk into classes and workshops with little or no previous drawing experience. The perspective drawing system in this book has been developed using the architectural approach as a starting point, but has been substantially simplified for the benefit of filmmakers and professionals in related fields.



How we learn:
A diagram

Examples of student progress



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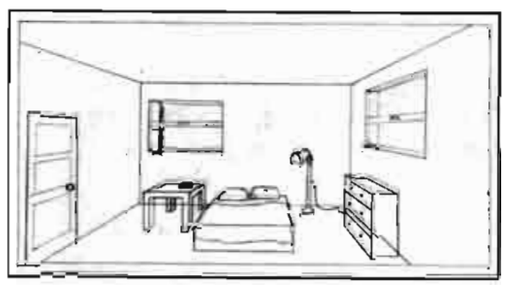

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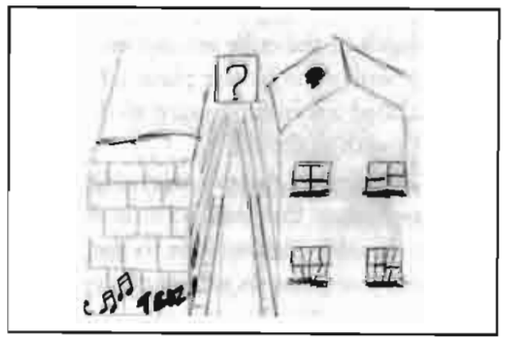

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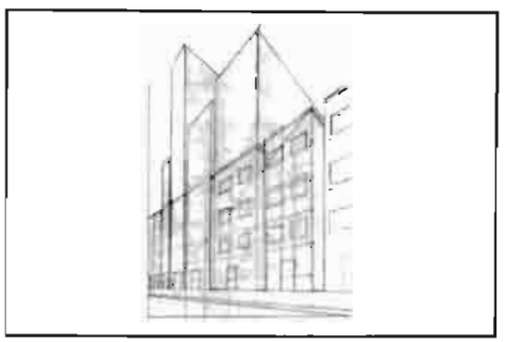
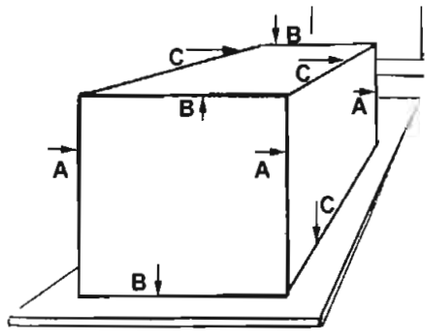


after

upper images: Nick Hill
lower images: Michael Bertucci

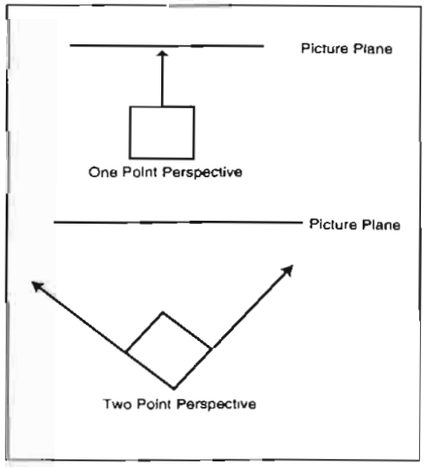
PERSPECTIVE IN YOUR ENVIRONMENT

The room you are sitting in is most likely constructed from walls that are at 90-degree angles to each other. If you're sitting at a table, the same is probably true for the relationship of its top and legs. Many if not most of the man-made objects in our environment are built on the right angle. It is easy to join together and creates strength in both lateral and vertical directions.



A = vertical lines
B = horizontal lines
C = needs vanishing pt!

In a cube we have three sets of facets which correspond to the height, depth, and length of three-dimensional space. When one or more of these facets are parallel to one side of our picture plane, then only the remaining sides will require vanishing points for the lines that define them in pictorial space. Perspective drawing is based on the relationship of the sets of parallel faces that result in objects built on right angles.



When looking at a cube straight-on, the top of the cube is parallel to the top edge of your imaginary picture plane. The sides of the cube are parallel to the vertical edges. Only the planes that describe the depth of the cube are not in a parallel relationship with your picture plane. Those are the edges that need a vanishing point to describe the illusion of depth in the frame.

If we now rotate that cube so that the front plane is on a 45-degree angle to the picture plane, then that plane as well as the previous plane needs vanishing points.

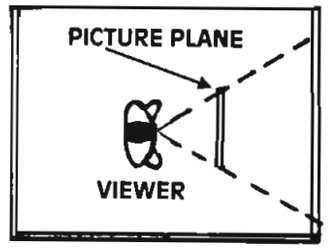
Perspective

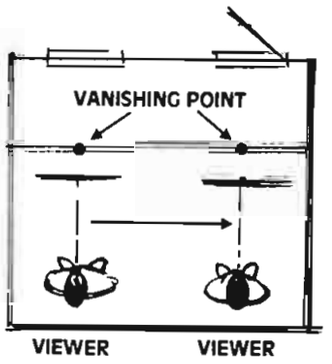
Vocabulary

Station point: The position of the observer. The placement of the camera. This position can be plotted in the overhead diagram.

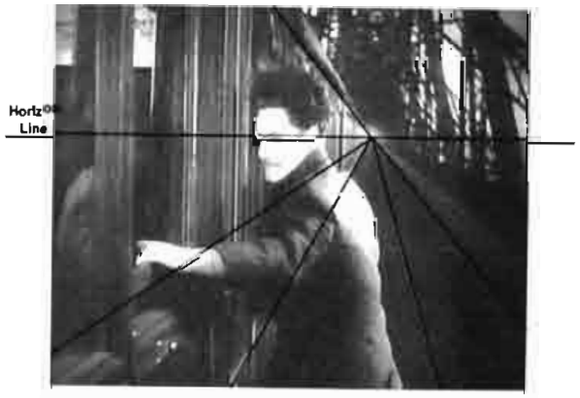
Picture plane: An imaginary plane set at a 90-degree angle to the observer, onto which the image of the scene is projected.

Imagine that you are holding a rectangular sheet of Plexiglas straight out in front of your body, and you are gazing through it at the world. That rectangle is acting as the picture plane. It is the two-dimensional surface that acts as projection screen for the three-dimensional world.



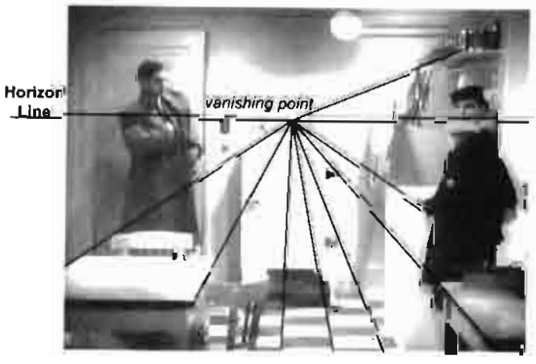


Horizon line: An imaginary line that is determined by the height of the camera or the observer of a scene.

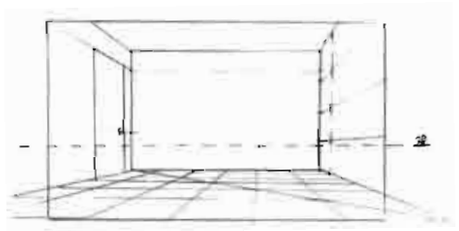


Vanishing point: A point which lies on the horizon and acts as a guide for the plotting of lines and planes that describe depth in the drawing.

Plan view (schematic): The layout of a scene from overhead. This is a diagram, not a drawing, of an overhead view of the set. Often used to situate camera positions within the sets. The plan view, or schematic, is used in perspective to plot the station point (camera position) in relation to the set pieces that are to be rendered.



1 pt = frontal shots, straight-on down street directly at wall of room



Cone of vision (Field of view): The perimeter of the observer's vision. In film, the cone of vision, also called "field of view," is limited by the aspect ratio of the frame. This field of view shifts according to the length of the lens used for the shot. The longer the lens, the narrower the cone of vision.

One-point perspective: The situation of needing only one vanishing point to describe depth in a scene. When we are looking at a cube straight-on, the top and the bottom planes of that cube will be parallel to the top and the bottom of the picture plane. The sides of the cube will be parallel to the vertical edges of the picture plane. Those planes will be described by lines that are horizontal and vertical. Only the planes that give the cube its depth will need to be described by lines that converge. These lines will converge at the vanishing point.

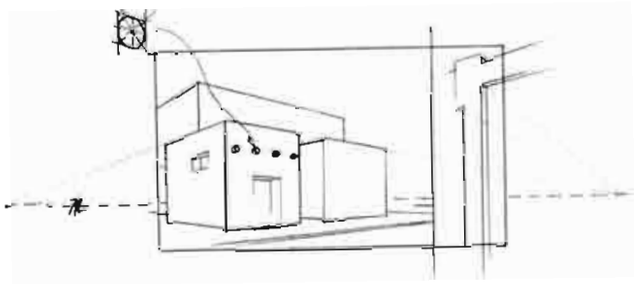
When to use one-point perspective
This system of perspective is used for sketching shots that are seen from frontal angles. The camera is placed straight-on to the back wall in interior shots and looks straight onto a building or down the street in exterior shots.

Two-point perspective: This is used in situations when two vanishing points are needed to communicate depth — as in when the cube is placed at an angle to the observer and the only set of planes that is parallel to the picture plane are the vertical ones. In this orientation, both sides of the cube are angled away from the observer and each set of lines that describe those sides will need its own vanishing point.

2 pt = 3/4 ∢ shots
raking angles
oblique angles

When to use two-point perspective
When you are setting up an interior shot that looks into a room corner or is at a raking angle (a position that is not square) in relation to the walls of the room, you will be using a two-point setup. Each wall will need its own vanishing point, as they are both carving the depth of the room space.

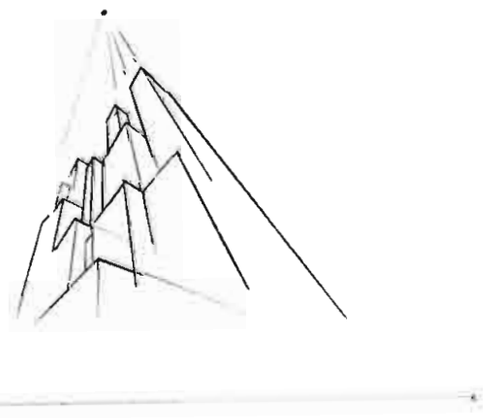
In exterior scenes, a camera that is viewing a building or street scene from a 3/4 angle will create a need for two vanishing points in your drawing.



Three-point perspective: A system used when the object has no faces that are parallel to the picture plane. The vertical lines as well as the lines parallel to the floor are drawn to vanishing points.

When to use three-point perspective
Usually for very high or low shots, when you need to convey the height of an object or building which is receding into the distance.

3 pt =
- **helicopter shots**
- **worm's eye view**

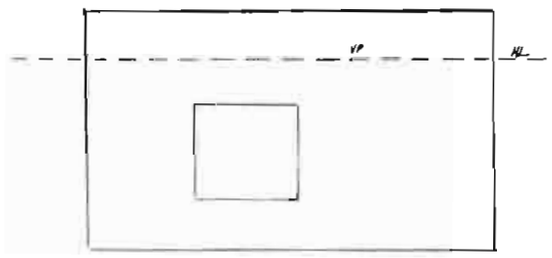


THE PENCIL HITS THE PAPER

The next section will cover the use of the perspective system in sketching storyboard imagery. It will cover both one- and two-point perspective systems and their application in creating a sketch that takes into account the camera height and position relative to the set and characters.

Drawing a Cube in One-point Perspective

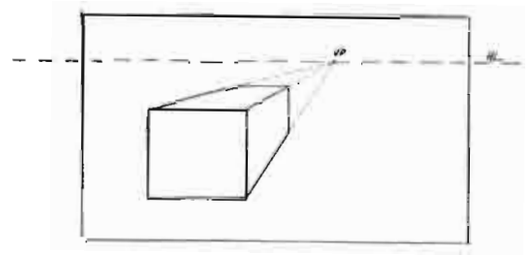
Start by making a frame on your paper. Using a 6" by 10 1/2" frame will give you an approximation of the 1.85 aspect ratio that is used as a standard in American projection projects. After completing your frame select a camera height by placing your horizon line some distance between the top and bottom edge of the frame. Start with selecting a high camera and draw a light line 1/4 of the way down from the top of the frame. The horizon line will be a horizontal line, unless the shot is set at a canted angle.



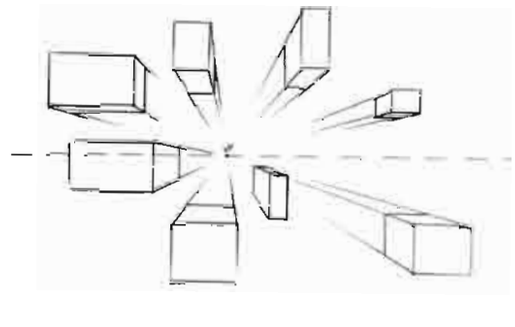
Once the horizon line is set, choose a position for the vanishing point. In one-point perspective, the vanishing point will always be on the horizon, equidistant from the sides of the frame.

Next, draw the front face of the box as a regular square. Remember that any face of the cube that is parallel to the top and the bottom of the frame can be drawn with vertical and horizontal lines. Only the faces that describe the depth of the cube will need a vanishing point as a guide.

Now that you have the front face of the cube, use the vanishing point to determine the angle of the sides and the top face of the cube. Use the vanishing point as a pivot and draw light lines from the corners of the front face back towards the horizon. These lines are "imaginary" and by drawing them to the horizon they have an infinite distance.



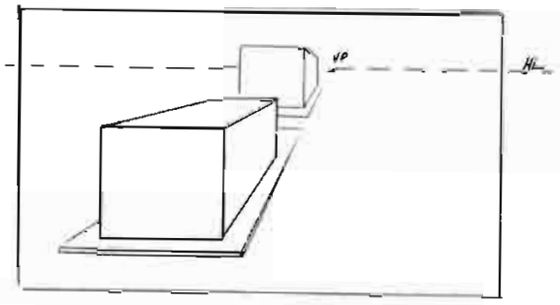
To finish off the cube, pass a vertical line through the bottom and the middle lines that you have just drawn. Where that line touches the top of the box, draw a horizontal line over to describe the back edge of your cube.



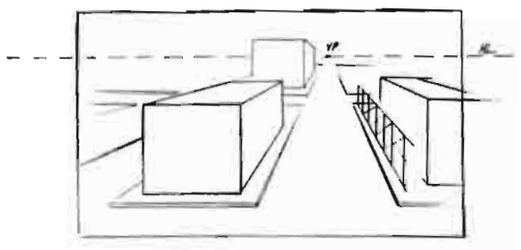
Transforming the Box into an Exterior Street Scene

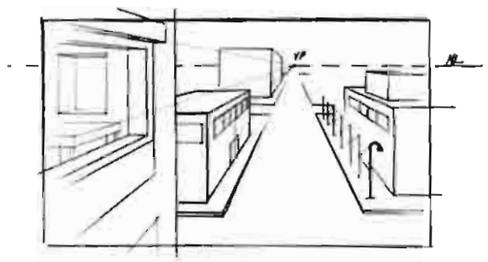
Once you have drawn this cube in perspective, begin to expand the drawing into a high-angle street scene. The box can be easily made into a building by adding doors, windows, and other architectural details.

Any doors or windows that appear on a front face (a regular rectangle) will be drawn with vertical and horizontal lines. Any details added to the planes that have been drawn using the vanishing points will also use those points to determine the angles of their upper and lower edges.



Adding streets is easy. Imagine that they are flat planes, like the bottoms of unfinished cubes, that create a grid around your cube-buildings. By using horizontal lines to send the streets across the frame and lines that aim toward the vanishing point to send the streets back into the depth of the drawing, you can create a scene that has a look of solid reality about it.



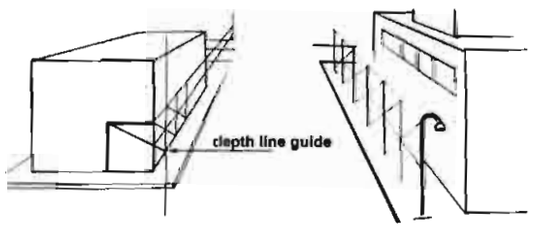


When you want to give those streets a curb, use a vertical line to drop down a small distance and then draw two more lines, one across the frame and another into the depth by way of the vanishing point.

Now have some fun. Add in buildings across the street, further back in the scene, and behind the ones in the foreground. Add a row of trees or telephone poles that diminish in height as they approach the vanishing point. Draw a box in above the horizon line and see what happens.

Measuring Depth in One-point Perspective Space

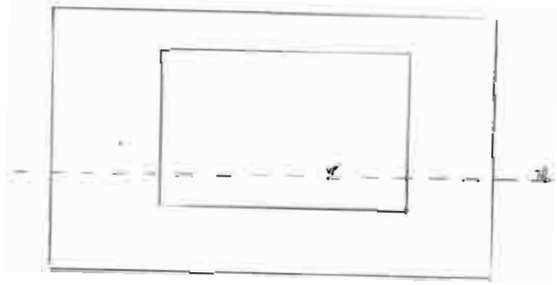
You can measure the depth of your object by the "eyeball" method and approximate the back edge by taking into consideration the decreasing size of the object's face as it recedes in space. Or, there is a method that allows you to use diagonal lines as guides to measure equal distances into the distance.



Begin by bisecting a vertical line of your box with a small mark. Pass a line from the opposite corner of the cube through that mark, and continue on until it crosses the bottom edge of a side. Where the two lines intersect, draw a vertical line and you will have drawn a box that is equal in measurement across the front and the sides.

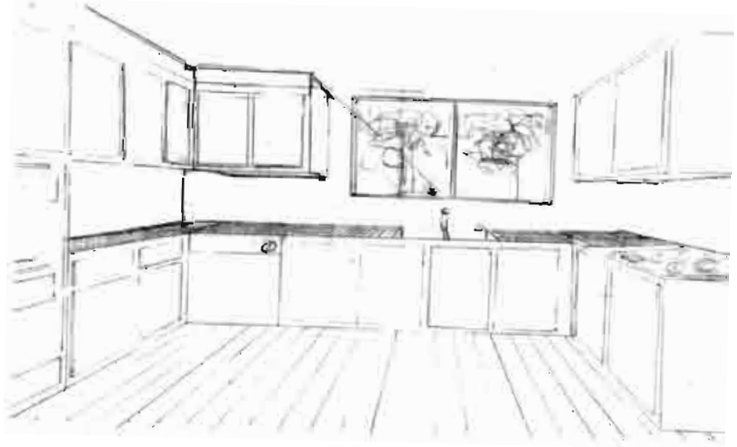
One-point Perspective Interiors

Now that you have the tools to draw boxes from the outside, let's go inside the box and draw the interior of a bedroom set.



Draw a frame as you did at the beginning of the last drawing. The first decision to make on the interior plan is to decide how much of the back wall is visible in the shot. If you are shooting down a long corridor, the back wall might appear as a small vertically oriented rectangle. If we are in a ballroom, then the back wall might be represented as a long, horizontal rectangle.

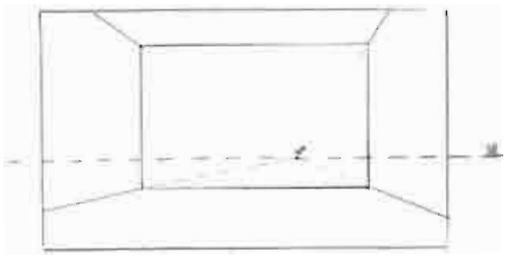
Since the camera's height will determine the height of the horizon line, the back wall must be drawn in before the horizon line is set. Choose a height for your camera and draw in the horizon as a horizontal line crossing through the back wall.

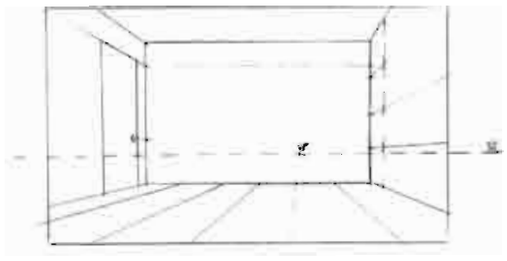


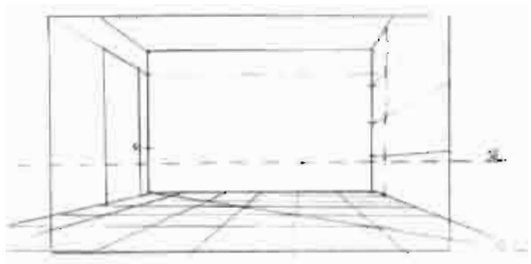
Student example
by Jennifer Nies

If the horizon line is drawn in above the back wall, that would signify a camera that is above the height of the set walls. There are some circumstances where this would be appropriate, but most situations call for the camera to be inside the room.

The rear wall of the room does not need to be centered in the frame. The camera can be







closer to either side wall if desired, but in any case the vanishing point will be centered in the frame.

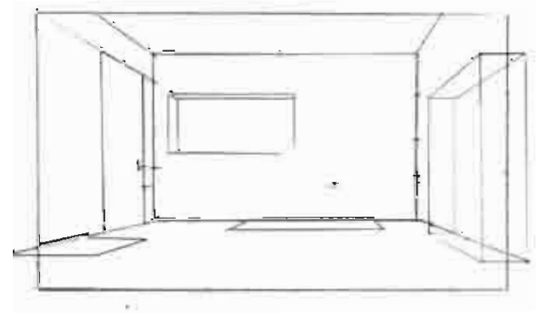
Mark the vanishing point on the horizon line and draw the lines that will delineate your walls, floor, and ceiling, passing each line through a corner of the rear wall and using the vanishing point as a guide to its angle.

Once the walls are set, then begin to add the details of the room: a door, a couple of windows, and perhaps a floor rug. Remember as you move around the room that any detail appearing on a wall that is drawn as a rectangle will also appear as a rectangle. Any detail appearing on a wall that is drawn to the vanishing point will also use the vanishing point to determine its top and bottom edges.

Adding Furniture to the Interior Scene

Just as the truck in the exterior scene was carved out of a box, the same method can be used to create furniture for the bedroom (or any other interior scene). To begin, locate the position of the bed by drawing a rectangle on the floor, the "footprint" of the object. To work in scale, we can apply the technique that we used in the previous example to work out the measurement of the side walls.

Mark out equal divisions on the horizontal floor line. Then use the vanishing point to extend them with light lines into the room.

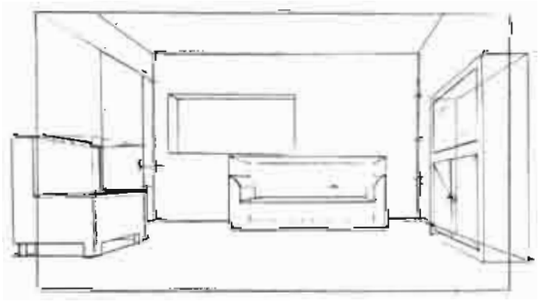


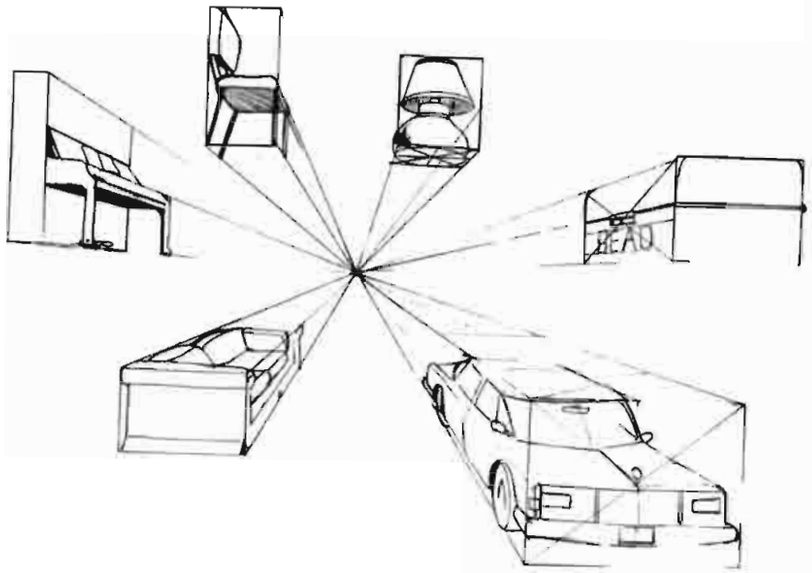
Draw a square in the corner of the back wall and bisect the side of the square that lies on the floor. Then pass a line through that mark from the vanishing point and out into the floor space. Where that line crosses each light line, you can draw a horizontal. Notice that the space between those lines increases as you move farther out into the room. Although that is the case, the lines represent equal distances along the floor. You can use this technique to scale the objects that you place in the room.

Once the bed's footprint is in place, raise one corner of it using a vertical line. Use the height of your back wall as a measure to make sure that the bed is in scale with the rest of the room. Once the height is set, then complete the cube. Make it into a bed by adding boxes on top with rounded edges that will become pillows and softening the lines of the large box to give it the visual feel of a mattress and bedding.

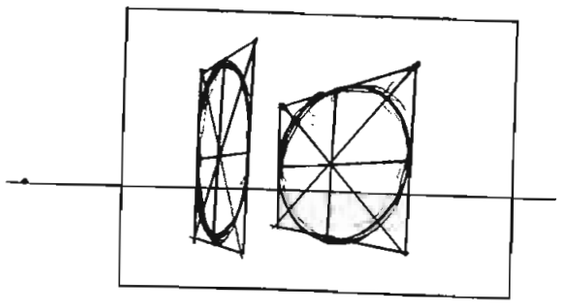
Chairs, Bookcases, Etc.

A slightly more complex form is the upholstered chair. Again, start with a footprint to give you the location of the chair in the room. Draw the facing plane first using vertical and horizontal lines. Then use the vanishing point to extend those lines to the back of the cube. As you do this, think of carving the space of the box. Look over the following examples of familiar furniture shapes that can be carved from cubes.





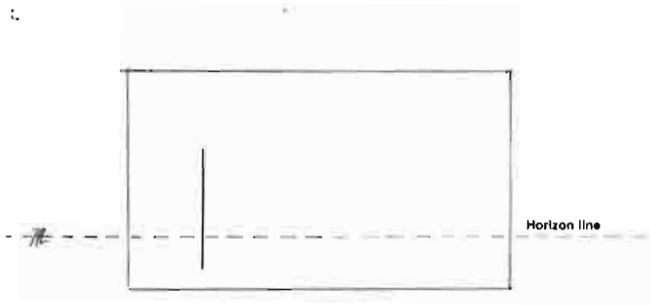
Circles in Perspective



Let's say that you have a hanging, cylindrical lamp on your set. Unless you are looking straight at the underside of the cylinder, the circle will appear as an ellipse when you draw it in perspective. In order to find the correct shape for the circular edge, first construct a square in perspective at the level of the lampshade. Then connect the opposite corners with straight lines. This will give you the center of your ellipse. Using the midpoint, draw two lines that bisect the rectangle and are either parallel to the edges or vanishing to the horizon. These four lines will touch the polygon at eight points. Now use these points as a guide to drawing the ellipse.

Two-point Perspective

The next point of view is that of looking into a corner of a room or at a building at a 3/4 angle. In this situation, you need two vanishing points for the two sets of planes that describe the depth of the space. First, we will set up a high, wide shot of a city street.



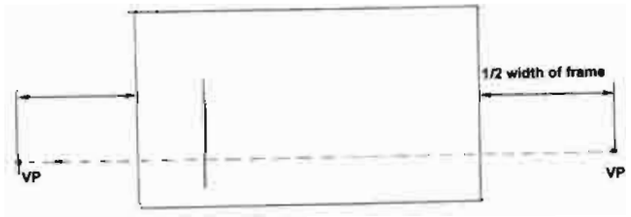
Draw a frame as you did in the last exercise. A 9" by 16" rectangle will give you a frame with an aspect ratio that approximates the American projection standard of 1.85. The horizon line will signify the height of the camera, so draw a horizontal line passing through the upper third and extending out to the sides of the frame. That is the line that the vanishing points will be drawn on.

Here's where the simple sketch method is different from the architecturally precise one. In an architectural perspective drawing, an artist will draw out the setting on a plan view or overhead drawing. Then each point on this overhead is carried out to the picture plane, drawn up into an elevation, and then finally taken back to the vanishing points in order to finish the perspective sketch. This is a time-consuming if visually precise way of rendering the scene.

We are going to skip a few steps. This will require you to take a few matters on trust, but the ends should justify these reduced means.

How to Find the Vanishing Points in Two-Point Perspective

The distance between the two vanishing points is determined by the length of the camera's lens and its distance from the subject. Changing lenses is tantamount to changing the observer's distance from what he or she is looking at as well. As the lens length changes — i.e., gets wider — the picture plane moves further away from the subject of the shot. As this happens the vanishing points spread out further and further. If the lens length grows longer, then the picture plane moves in.



If we dispense with the steps of drawing an overhead and plotting the points of the set onto an elevation, then we need a quick way of determining the placement of the vanishing points by eye. The suggested placement is one-half a frame's distance outside the frame on either side for a natural, 50 mm lens length appearance.

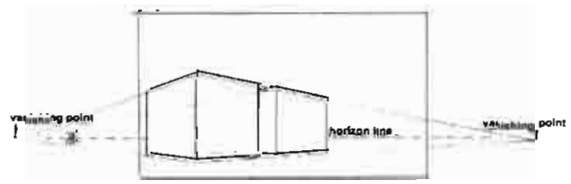
You will find that if you decrease this space and place the points next to the frame, you will end up with a drawing in which the objects begin to show distortion as they near the vanishing points. This distortion would be similar to what you would find if you were shooting with an 18 mm lens.

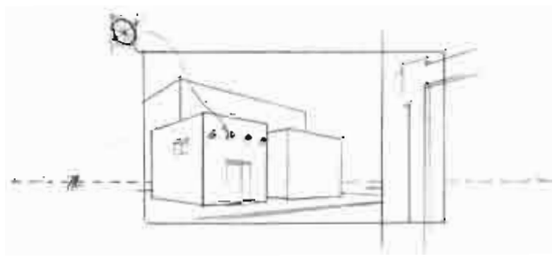
The distance between the two vanishing points is relative to the distance of the picture plane from the object. The points can be equidistant from the frame, which describes an object that is angled 45 degrees to the picture plane.

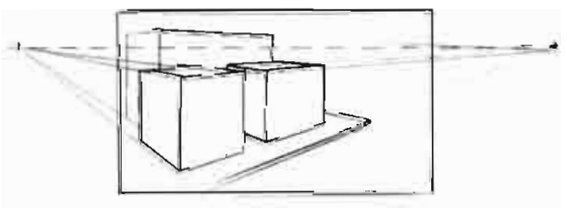
When the angle of the object changes, the vanishing points move along the horizon line so that one or the other is closer and the other is further away, keeping the same relative distance as they move.

THE LONGER THE LENS, THE FARTHER OUT FROM THE FRAME THE VANISHING POINTS WILL APPEAR.

Drawing a Box in Two-point Perspective, Exterior Scene

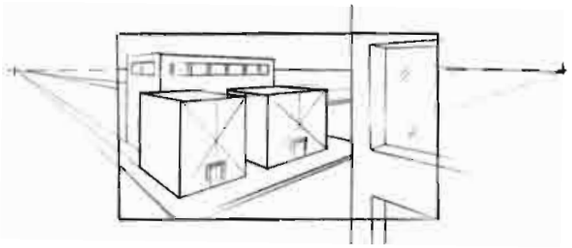






After you draw a frame choose a height for the camera. Lay in the horizon line, and for a natural-looking image, place the vanishing points approximately one half a frame's width outside the frame. This will keep the angles of the drawing from getting too severe, which can happen when the points are drawn too close to the frame. Think of the distortion that an 18 mm lens can create when shooting objects close-up.

Once the vanishing points are in place, draw in a vertical line that will stand for the height of the box on the edge that is closest to the camera. Now use the vanishing points to draw in the sides and the top of the box. With this method, you will "eyeball" the distance to the back edge of the object.

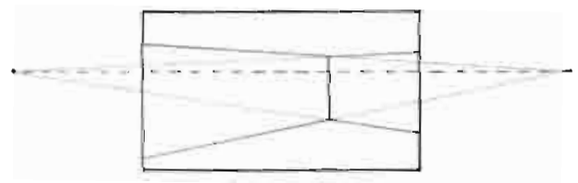


Once you have the two-point perspective cube drawn, enlarge the image so that you have another street scene. Try giving it some character, like an old-style street out of a western or a futuristic scene from the year 2300.

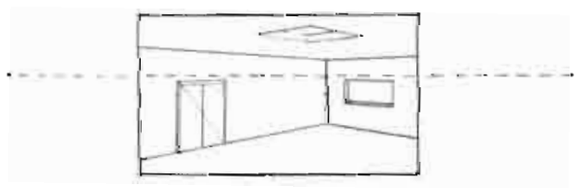
Try drawing the same street using a higher camera. Just place the horizon line near the top of the frame. Use the same vanishing point and vertical start lines and start sketching.

Two-point Perspective Interiors

You will use this approach when you are setting up a shot that is looking into a corner of a room. It also is known as a 3/4 angle or raking shot.



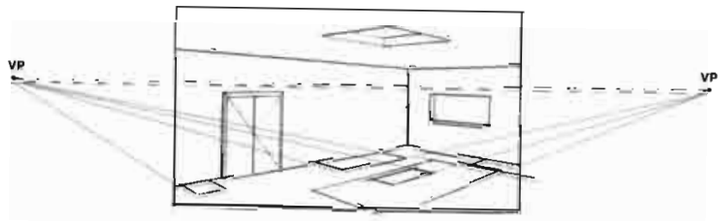
Start with a horizontal frame and visualize how far you are from the back wall or the corner of the space. As in the interior of the one-point perspective room, the back wall line needs to be drawn in before the horizon line is set. If you are looking deep into a large space, the line might cover only a fraction of the height of the frame. If you are in a smaller room, the line will be longer.

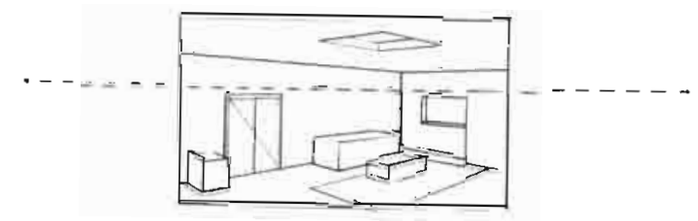


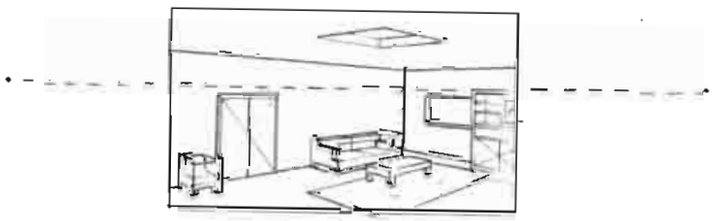
Place a vertical line in your frame and decide the height of the camera by drawing a horizon line through the frame. Place the two vanishing points on the horizon line, outside the frame itself. Now draw the lines

that will describe the ceiling, floor, and walls. Use the vanishing points as pivots and draw *the left wall using the right vanishing point and the right wall using the left one.* This can be tricky to remember, but in two-point perspective you only use the right vanishing point to draw right-sided planes when you are drawing the outside of a box. When you are inside the box, you flip the orientation and use the *opposite* vanishing point.

This procedure may seem strange at first, but after drawing a few interiors it will become second nature. Once the walls are drawn in, begin to furnish the room. Pop in a couple of windows, a door, and try a fireplace. Add a table, some chairs, and place a couple of standing figures in the scene. You can use the vanishing points to scale the figures in the space.





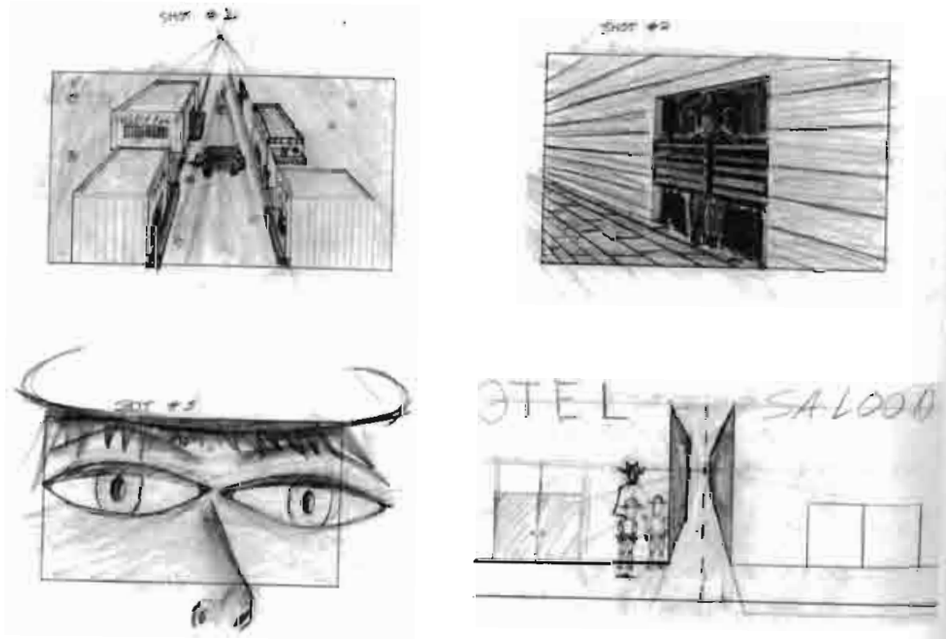


Exercise

Once you have gone through the proceeding material, try to render this short shot list using the correct version of perspective and the appropriate horizon line. A student example is provided for reference.

1. Exterior day, western town. High angle, frontal shot of a small 19th century town. A wagon lies abandoned in the street.
2. Full shot of the saloon doors, a man waits to come through. Eyelevel raking angle.
3. ECU of man's eyes, frontal.
4. Straight-on wide shot, eye-level of the front of saloon. Track left to follow man over to hotel.

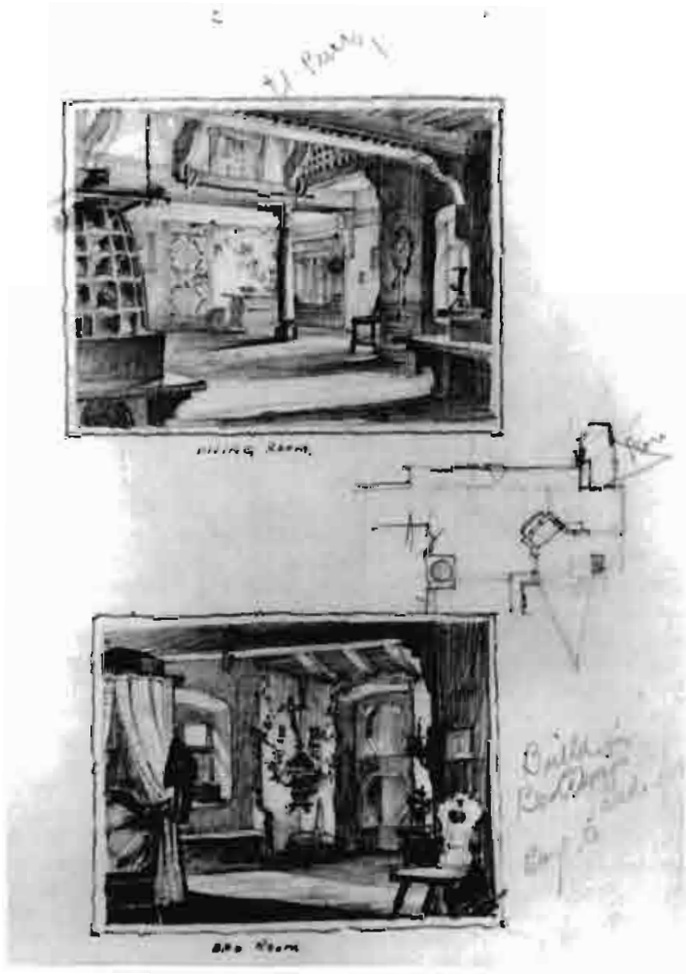
Student example



drawings: Eric Thompson

BEYOND THE BOX

This chapter has offered some bare-bones techniques on adding space to your sketches. It is meant as a tool for those writers and directors who need a simple visual language to communicate their shot ideas. For additional information on perspective, please refer to the excellent sources in the Bibliography (page 219) and consider taking a short class in linear perspective at your local community college or art academy.



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